

CLAIMS

1. An axle driving apparatus comprising;
a first housing member and a second housing member joined to the first housing member along a joint surface to form a sump;
5 a center section mounted in the sump and comprising a pump running surface and a motor running surface formed generally perpendicular to the pump running surface;
an axial piston pump positioned on the pump running surface and an axial piston motor positioned on the motor running surface; and
a thrust bearing mounted in the sump and engaged to the axial piston motor,
10 wherein the center section is located entirely between the joint surface and the thrust bearing.
2. The axle driving apparatus of Claim 1, further comprising a motor shaft engaged to and driven by the axial piston motor and an axle shaft driven by the motor shaft, wherein the axes of the motor shaft and axle shaft are generally parallel.
- 15 3. The axle driving apparatus of Claim 2, further comprising a pump shaft drivingly engaged to the pump wherein the pump shaft is generally perpendicular to the axle shaft.
4. The axle driving apparatus of Claim 1, further comprising a swash plate engaged to the axial piston pump and having an axis of rotation that is generally parallel to the longitudinal axis of the motor shaft.
- 20 5. The axle driving apparatus of Claim 4, wherein the swash plate axis of rotation, the input shaft axis of rotation and the motor shaft axis of rotation are generally coplanar.

6. The axle driving apparatus of Claim 4, wherein the swash plate comprises a first trunnion rotatably mounted in the first housing member and a second trunnion rotatably mounted in the second housing member.
7. The axle driving apparatus of Claim 6, wherein the first and second trunnions are
5 integrally formed on the swash plate.
8. The axle driving apparatus of Claim 1, wherein the center section is attached to the first housing member by means of fasteners that are generally perpendicular to the joint surface.
9. The axle driving apparatus of claim 8, wherein the center section comprises
10 fastener openings located on a portion of the center section generally parallel to and offset from the motor running surface.
10. An axle driving apparatus comprising;
a first housing member and a second housing member joined to the first housing member along a joint surface to form a sump;
15 a center section mounted in the sump and comprising a pump running surface having an axial piston pump mounted thereon, and a motor running surface formed generally perpendicular to the pump running surface and having an axial piston motor mounted thereon;
a motor shaft engaged to and driven by the axial piston motor, the motor shaft
20 having a longitudinal axis that is generally perpendicular to the joint surface;
a gear train mounted in the sump and driven by the motor shaft and at least one axle engaged to and driven by the gear train, wherein the longitudinal axis of the axle is parallel to the longitudinal axis of the motor shaft; and

a thrust bearing engaged to the axial piston motor, wherein the center section, axial piston motor, axial piston pump and thrust bearing are located between the joint surface and an interior surface of one of the housing members.

11. The axle driving apparatus of Claim 10, wherein the center section is mounted
5 within the first housing member by fasteners that are generally perpendicular to the joint surface.

12. The axle driving apparatus of Claim 11, wherein the center section comprises fastener openings located on a portion of the center section generally parallel to and offset from the motor running surface.

10 13. The axle driving apparatus of Claim 12, wherein the input shaft is positioned between at least one set of center section fastener openings and the motor running surface.

14. An axle driving apparatus comprising;
a first housing member and a second housing member joined to the first housing
15 member along a joint surface to form a sump;
a center section mounted in the sump and comprising a pump running surface and a motor running surface generally perpendicular to the pump running surface;
an axial piston pump positioned on the pump running surface and an axial piston motor positioned on the motor running surface;
20 a motor shaft engaged to the axial piston motor and having a longitudinal axis that is generally perpendicular to the joint surface;
a thrust bearing engaged to the axial piston motor, wherein the center section is positioned between the joint surface and the thrust bearing; and

a swash plate engaged to the axial piston pump and comprising integrally formed trunnions having an axis of rotation that is generally perpendicular to the joint surface.

15. The axle driving apparatus of Claim 14, further comprising a pump shaft engaged to the pump, wherein the pump shaft, motor shaft, and swash plate axis of rotation are
5 generally co-planar.

16. The axle driving apparatus of claim 14, further comprising a thrust bearing positioned within the swash plate and engaged to the axial piston pump, wherein the thrust bearing is located between the joint surface and an interior wall of one of the housing members.

10 17. The axle driving apparatus of claim 14, further comprising an axle shaft having a longitudinal axis that is generally parallel to the longitudinal axis of the motor shaft.

18. The axle driving apparatus of claim 14, wherein the motor shaft is positioned on one side of the pump running surface and the swash plate axis of rotation is positioned on the opposite side of the pump running surface.